

REMARKS

The Examiner's Action mailed on Feb. 10, 2005 has been received and its contents carefully considered. In this Amendment, Applicants have amended claims 1, 7 and 13, and cancelled claims 6 and 12. Claims 1, 7 and 13 are independent claims. Claims 1-5, 7-11 and 13-20 are now pending in the application. For at least the following reasons, it is submitted that this application is in condition for allowance.

Claims 1-6 have been rejected under 35 U.S.C. 103 (a) as allegedly unpatentable over the Applicant's Admitted prior art shown in FIG.1A and 1B of the application. It is submitted that the claims are patentably distinguishable over the cited reference for at least the following reasons.

Applicants' independent claim 1 is directed to an anti-corrosion shower head used in a dry etching tool comprising an aluminum base, a ceramic nozzle plate and an Al₂O₃ film formed on a surface of the shower head by electroplating in an oxalic acid solution. The aluminum base has a front side and a rear side. The ceramic nozzle plate having a plurality of gas holes to spray the gas is embedded in the front side of the aluminum base while the rear side of the aluminum base corresponding to the ceramic nozzle plate is hollowed. This claimed shower head has the advantage discussed in Applicants' specification, for example, the Al₂O₃ film coated using oxalic acid solution greatly prolongs the longevity of the shower head, about 6 times (*see* para. [0018]). This is neither disclosed nor suggested by the applicant's admission of prior art, even by the cited references.

In addition, the admitted prior art disclosed a method of forming the Al₂O₃ film on the shower head using sulphuric acid, and the Al₂O₃ film coated by the electroplating solution of

sulphuric acid has a thickness of 45~55 μm . The Al_2O_3 film coated on the aluminum surface has the function of anti-corrosion and insulation. After the shower head has been used over a period of time, the Al_2O_3 film starts to peel off due to plasma collision and etching gas corrosion (para. [0003] - para. [0006]). The peeling off phenomena, particularly occurring at the shape corners of the shower head, can cause the “point discharge” and result in short-circuit. According to the prior art and the conventional process concept, the Al_2O_3 film should be thicker for preventing the pure aluminum from being exposed too early, so as to prolong the longevity of the shower head.

In contrast, claim 1 defines an Al_2O_3 film coated by an oxalic acid solution that is thinner than that coated by sulphuric acid. The longevity of the shower head of the present invention is even six times longer than that of the conventional shower head (para. [0018]). This is neither suggested nor taught by the prior art or any cited reference. Thus, from the proposed prior art or any cited reference, it has no reasonable expectation of coating an Al_2O_3 film using oxalic acid. It is thus submitted that claim 1 is patentably distinguishable over the prior art. It is requested that the rejection be withdrawn.

Also, claims 7-12 have been rejected under 35 U.S.C. 103 (a) as allegedly unpatentable over the Applicant's Admitted prior art shown in FIG.1A and 1B of the application and in view of Japanese Patent JP 40923999 A to Aoki. It is submitted that the claims are patentably distinguishable over the cited reference for at least the following reasons.

Applicants' independent claim 7 is directed to an anti-corrosion shower head used in a dry etching tool comprising an aluminum base, an engineering polymer nozzle plate and an Al_2O_3 film formed on a surface of the shower head by electroplating in an oxalic acid solution. Similarly, the Al_2O_3 film formed by oxalic acid is neither disclosed nor suggested by the applicant's admission of prior art, even by the cited references. Also, Japanese Patent JP

40923999 A to Aoki disclosed a nozzle plate applied in a piezoelectric inkjet printer, not a nozzle plate applied in a shower head used in a dry etching tool for spraying a corrosive etching gas. In Aoki's patent, the nozzle plate 4 (FIG. 4) made of polyimide resin has a plurality of nozzles 4a, and the actuator 2 made of ceramic has a plurality of channels 3. The nozzle plate 4 is attached to the actuator 2. Since the coefficient of thermal expansion of polyimide resin is larger than that of piezoelectric ceramic, the distance A between the nozzles 4a is designed to be smaller than the distance B between the channels 3. After thermal expansion, the nozzles 4a are properly corresponding to the channels 3 for correctly eject the ink. Accordingly, Aoki disclosed a method about how to match the positions of channels and nozzles after both of them being thermal expanded. Whether the engineering polymer nozzle plate, particularly polyimide resin, is anti-corrosive is neither disclosed nor suggested in Aoki's patent. It is thus submitted that claim 7 is patentably distinguishable over the prior art and the cited reference. Therefore, for at least this reason, the rejection is misplaced and should be withdrawn.

Also, claims 13-20 have been rejected under 35 U.S.C. 103 (a) as allegedly unpatentable over the applicant's admission of prior art shown in FIG.1A and 1B of the application and in view of U.S. Patent No. 5,916,720 to Springett. It is submitted that the claims are patentably distinguishable over the cited reference for at least the following reasons.

Springett appears to disclose a method of forming an electrostatographic imaging member. According to the Springett, the charging blocking layer of the imaging member can be formed by anodic oxidation, and the feasible acidic solution (used as the electrolytic solution) could be an inorganic acid selected from sulfuric acid, phosphoric acid, chromic acid and the like, or an organic acid selected from oxalic acid, malonic acid, oleic acid, and tartaric acid (col. 3, line 65 - col. 4, line 61). There is no any suggestion or disclosure in Springett about forming


an anti-corrosive layer on a shower head, and about which acid should be applied to form an Al_2O_3 film with better anti-corrosive property. It is thus submitted that claim 13 is patentably distinguishable over the prior art and the cited reference. It is requested that the rejection be withdrawn.

For at least the foregoing reasons, independent claims 1, 7 and 13 patentably distinguish over the prior art and the cited references. Dependent claims 2-5, 8-11 and 14-20 are allowable for at least the reason that they depend from claims 1, 7 and 13. Therefore, all pending claims of this application are in condition for allowance. Such action and the passing of this case to issue are therefore respectfully requested.

If the Examiner believes that a conference would be of value in expediting the prosecution of this application, the Examiner is hereby invited to telephone the undersigned counsel to arrange for such a conference.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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